

IN THE CLAIMS:

Please add new claims 48-57.

This listing of claims will replace all prior versions, and listings of the claims in the application.

Listing of the claims

1. **(Original)** A method of identifying a uniquely targeting siRNA nucleotide sequence for a target mRNA sequence of a target species comprising the steps of:

comparing a database of mRNA sequences from the target species with an siRNA nucleotide sequence that consists of 18-25 including at least 11 consecutive nucleotides complementary to the target mRNA sequence to be cleaved by the siRNA nucleotides, wherein the at least 11 consecutive nucleotides complementary to the target mRNA sequence include a nucleotide that is third from an siRNA nucleotide sequence's 5' end; and

determining if, in addition to the target mRNA sequence, one or more additional mRNA sequences in the database are complementary to an 11 consecutive nucleotide sequence of the siRNA nucleotide sequence including the third nucleotide from the 5' end of the siRNA nucleotide,

wherein an absence of one or more additional mRNA sequences in the database that are complementary to an 11 consecutive nucleotide sequence of the siRNA nucleotide sequence including the third nucleotide from the 5' end of the siRNA nucleotide indicates that the siRNA nucleotide sequence is a uniquely targeting siRNA nucleotide sequence.

2. **(Original)** A method of designing a uniquely targeting siRNA for a target mRNA molecule comprising the steps of:

a) identifying an siRNA nucleotide sequence for the target mRNA, said sequence consisting of 18-24 nucleotides including a nucleotide sequence that has 11 consecutive

nucleotides, including the third nucleotide from the siRNA nucleotide sequence's 5' end, that are complementary to an 11 nucleotide sequence that occurs on the target mRNA molecule;

comparing the siRNA nucleotide sequence with a database of mRNA sequences from the target mRNA species; and

determining if, in addition to the target mRNA sequence, one or more additional mRNA sequences in the database are complementary to an 11 consecutive nucleotide sequence of the siRNA nucleotide sequence including the third nucleotide from the 5' end of the siRNA nucleotide,

wherein an absence of one or more additional mRNA sequences in the database that are complementary to an 11 consecutive nucleotide sequence of the siRNA nucleotide sequence including the third nucleotide from the 5' end of the siRNA nucleotide indicates that the of the siRNA nucleotide is a uniquely targeting siRNA nucleotide sequence.

3. **(Previously presented)** The method of claim 1 wherein the database of mRNA sequences is a selected from the group consisting of: NCBI database and ENSEMBL database.

4. **(Previously presented)** The method of claim 1 wherein the comparing of the siRNA nucleotide sequence with the database of mRNA sequences from the target mRNA species is performed by a computer.

5. **(Previously presented)** The method of claim 1 wherein the comparing of the siRNA nucleotide sequence with the database of mRNA sequences from the target mRNA species is performed by a computer using a BLAST program.

6. **(Previously presented)** The method of claim 1 wherein the siRNA nucleotide sequence consists of 18, 19, 20, 21, 22, 23, 24 or 25 nucleotides.

7. **(Canceled)**

8. **(Canceled)**

9. **(Canceled)**

10. **(Previously presented)** The method of claim 1 wherein the target mRNA is selected from the group consisting of: an mRNA encoding an oncogene, an mRNA encoding a pathogen protein, a cytokine, a chemokine, a co-stimulatory molecule and a growth factor.

11. **(Canceled)**

12. **(Canceled)**

13. **(Previously presented)** A method of synthesizing a uniquely targeting siRNA for a target mRNA molecule comprising the steps of:

identifying or designing uniquely targeting siRNA nucleotide sequence for the target mRNA according to claim 1; and

synthesizing an siRNA molecule having the uniquely targeting siRNA nucleotide sequence.

14. **(Original)** A method of inhibiting expression of a target mRNA molecule comprising the steps of:

synthesizing a uniquely targeting siRNA for a target mRNA molecule according to claim 13; and

contacting a target mRNA molecule with an RISC that comprises an siRNA molecule that comprises the uniquely targeting siRNA nucleotide sequence.

15. **(Original)** A method of identifying an miRNA nucleotide sequence that does not function as a siRNA nucleotide sequence for mRNA of a target species comprising the steps of:
- comparing a database of mRNA sequences from the target species with an miRNA nucleotide sequence that consists of 18-24 nucleotides; and
 - determining if one or more mRNA sequences in the database are complementary to an 11 consecutive nucleotide sequence of the miRNA nucleotide sequence including the third nucleotide from the 5' end of the miRNA nucleotide,
- wherein an absence of one or more mRNA sequences in the database that are complementary to an 11 consecutive nucleotide sequence of the miRNA nucleotide sequence including the third nucleotide from the 5' end of the miRNA nucleotide indicates that the miRNA nucleotide sequence does not function as a siRNA nucleotide sequence for mRNA of a target species.
16. **(Original)** A method of designing an miRNA nucleotide sequence that does not function as a siRNA nucleotide sequence for mRNA of a target species comprising the steps of:
- identifying an miRNA nucleotide sequence that consists of 18-24 nucleotides;
 - comparing the miRNA nucleotide sequence with a database of mRNA sequences from the target mRNA species; and
 - determining if one or more mRNA sequences in the database are complementary to an 11 consecutive nucleotide sequence of the miRNA nucleotide sequence including the third nucleotide from the 5' end of the miRNA nucleotide,
- wherein an absence of one or more mRNA sequences in the database that are complementary to an 11 consecutive nucleotide sequence of the miRNA nucleotide sequence including the third nucleotide from the 5' end of the siRNA nucleotide indicates that the miRNA nucleotide sequence does not function as a siRNA nucleotide sequence for mRNA of a target species.

17. **(Previously presented)** The method of claim 15 wherein the database of mRNA sequences is selected from the group consisting of: NCBI database and ENSEMBL database.

18. **(Previously presented)** The method of claim 15 wherein the comparing of the miRNA nucleotide sequence with the database of mRNA sequences from the target species is performed by a computer.

19. **(Previously presented)** The method of claim 15 wherein the comparing of the miRNA nucleotide sequence with the database of mRNA sequences from the target species is performed by a computer using a BLAST program.

20. **(Previously presented)** The method of 15 wherein the miRNA nucleotide sequence consists of 18, 19, 20, 21, 22, 23, 24 or 25 nucleotides.

21. **(Canceled)**

22. **(Canceled)**

23. **(Canceled)**

24. **(Previously presented)** The method of claim 15 wherein the miRNA inhibits translation of mRNA selected from the group consisting of: an mRNA encoding an oncogene, an mRNA encoding a pathogen protein, a cytokine, a chemokine, a co-stimulatory molecule and a growth factor.

25. **(Canceled)**

26. **(Canceled)**

27. **(Previously presented)** A method of synthesizing an miRNA that does not function as a siRNA nucleotide sequence for mRNA of a target species comprising the steps of:

identifying or designing an miRNA nucleotide sequence that does not function as an siRNA nucleotide sequence for mRNA of a target species according to 15; and

synthesizing an miRNA molecule that has an miRNA nucleotide sequence that does not function as an siRNA nucleotide sequence for mRNA of a target species.

28. **(Original)** A method of inhibiting expression of a target mRNA molecule comprising the steps of:

synthesizing an miRNA that does not function as a siRNA nucleotide sequence for mRNA of a target species according to claim 27; and

contacting a target mRNA molecule with an miRNP that comprises an miRNA that does not function as a siRNA nucleotide sequence for mRNA of a target species.

29. **(Original)** A uniquely targeting siRNA molecule consisting of 18-25 nucleotides including a nucleotide sequence that has at least 11 consecutive nucleotides, including the third nucleotide from the 5' end of the siRNA molecule, that are complementary to a nucleotide sequence that occurs on a target mRNA molecule and not on another mRNA from a target species.

30. **(Original)** The uniquely targeting siRNA molecule of claim 29 wherein the nucleotide sequence of the siRNA molecule is fully complementary with a sequence of the target mRNA molecule.

31. **(Original)** An siRNA molecule consisting of 18-25 nucleotides including a nucleotide sequence that has at least 11 consecutive nucleotides, including the third nucleotide from the 5' end of the siRNA molecule, that are complementary to a nucleotide sequence that occurs on a

target mRNA molecule and not on another mRNA from a target species, wherein the siRNA molecule is not fully complementary with a sequence of the target mRNA molecule.

32. **(Previously presented)** The siRNA molecule of claim 31 consisting of 18, 19, 20, 21, 22, 23, 24 or 25 nucleotides.

33. **(Canceled)**

34. **(Canceled)**

35. **(Canceled)**

36. **(Previously presented)** The siRNA molecule of claim 29 wherein the target mRNA is selected from the group consisting of an mRNA encoding: an oncoprotein, a tumor suppressor, a pathogen protein, a cytokine, an interleukin, a chemokine, a co-stimulatory molecule and a growth factor.

37. **(Canceled)**

38. **(Canceled)**

39. **(Previously presented)** A RISC comprising an siRNA molecule of claim 29.

40. **(Original)** An miRNA molecule for a target mRNA of a target species, wherein said miRNA molecule consists of 18-25 nucleotides and does not function as a siRNA nucleotide sequence for mRNA of a target species.

41. **(Previously presented)** The miRNA molecule of claim 40 consisting of 18, 19, 20, 21, 22, 23, 24 or 25 nucleotides.

42. **(Canceled)**

43. **(Canceled)**

44. **(Canceled)**

45. **(Previously presented)** The miRNA molecule of claim 40 wherein the target mRNA is selected from the group consisting of an mRNA encoding: an oncoprotein, a tumor suppressor, a pathogen protein, a cytokine, an interleukin, a chemokine, a co-stimulatory molecule and a growth factor.

46. **(Canceled)**

47. **(Canceled)**

48. **(New)** The method of claim 2 wherein the database of mRNA sequences is a selected from the group consisting of: NCBI database and ENSEMBL database.

49. **(New)** The method of claim 2 wherein the comparing of the siRNA nucleotide sequence with the database of mRNA sequences from the target mRNA species is performed by a computer.

50. **(New)** The method of claim 2 wherein the comparing of the siRNA nucleotide sequence with the database of mRNA sequences from the target mRNA species is performed by a computer using a BLAST program.

51. **(New)** The method of claim 2 wherein the siRNA nucleotide sequence consists of 18, 19, 20, 21, 22, 23, 24 or 25 nucleotides.

52. **(New)** The method of claim 2 wherein the target mRNA is selected from the group consisting of: an mRNA encoding an oncogene, an mRNA encoding a pathogen protein, a cytokine, a chemokine, a co-stimulatory molecule and a growth factor.

53. **(New)** The method of claim 16 wherein the database of mRNA sequences is selected from the group consisting of: NCBI database and ENSEMBL database.

54. **(New)** The method of claim 16 wherein the comparing of the miRNA nucleotide sequence with the database of mRNA sequences from the target species is performed by a computer.

55. **(New)** The method of claim 16 wherein the comparing of the miRNA nucleotide sequence with the database of mRNA sequences from the target species is performed by a computer using a BLAST program.

56. **(New)** The method of 16 wherein the miRNA nucleotide sequence consists of 18, 19, 20, 21, 22, 23, 24 or 25 nucleotides.

57. **(New)** The method of claim 16 wherein the miRNA inhibits translation of mRNA selected from the group consisting of: an mRNA encoding an oncogene, an mRNA encoding a pathogen protein, a cytokine, a chemokine, a co-stimulatory molecule and a growth factor.